

WILKINSON) BARKER) KNAUER) LLP

1800 M STREET, NW
SUITE 800N
WASHINGTON, DC 20036
TEL 202.783.4141
FAX 202.783.5851
WWW.WBKLaw.COM
ADAM D. KRINSKY
202.383.3340
AKRINSKY@WBKLAW.COM

April 20, 2016

VIA ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Presentation
Higher Ground LLC
Blanket License Application for C-band Mobile Earth Terminals
IBFS File No. SES-LIC-20150616-00357

Dear Ms. Dortch:

On April 18, 2016, Higher Ground CEO Rob Reis, Bruce McKinley, and the undersigned met with representatives of the International Bureau and Wireless Telecommunications Bureau (listed in the Attachment) regarding the above-referenced application. During the meeting, Higher Ground conducted an outdoor demonstration of the SatPaq, provided an update on SatPaq developments, and responded to recent claims in the record.

Outdoor Demonstration of SatPaq Operations

The outdoor demonstration allowed Commission staff to directly engage with a “live” SatPaq embedded in a smartphone case, connected via Bluetooth to a smartphone, and operated by a downloaded app, the SatPaq app. Higher Ground showed that, for the consumer, the SatPaq app provides a standard messaging interface and a seamless, real-time service. The SatPaq delivered text messages to Commission staffers’ mobile devices in real-time via an Intelsat geostationary satellite 22,236 miles away, and staffers texted return messages from their mobile devices to the SatPaq-enabled smartphone. In addition, the demonstration provided a visualization of the Channel Master software, which applied the GPS location of the SatPaq to a ULS-derived database of all C-band point-to-point microwave receivers to identify available non-interfering frequencies.

The demonstration provided a real-world showing of the permission-based, database-driven spectrum access regime that Higher Ground has developed to enable more intensive use

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of C-band spectrum while ensuring no harmful interference to point-to-point microwave receivers. Higher Ground's proposal will deliver on a promise of the National Broadband Plan to provide for innovative database-driven spectrum sharing, particularly where incumbent service facilities are "generally fixed and known," and their radiofrequency ("RF") operations are "well understood and predictable."¹

Update on SatPaq Developments

Following the demonstration, Higher Ground updated staff on SatPaq developments, particularly the Channel Master software. As Higher Ground has previously explained, that software identifies non-interfering frequencies for SatPaq operations by engaging in a rigorous, conservative link analysis for C-band point-to-point microwave operations.² The link analysis requires the SatPaq to stay 6 dB (or more) below Boltzman Noise generally.

The Channel Master analysis takes into account all relevant ULS-derived data for individual C-band point-to-point receivers, including their location and orientation, operating frequencies, antenna patterns, antenna height, height above mean sea level, diffraction, and polarization, as well as the SatPaq's location and orientation, and the use of frequency diversity and satellite choice. The Channel Master software registers the SatPaq's GPS-derived location and evaluates all nearby point-to-point microwave receivers not limited by signal blockage of the earth. This will include all point-to-point operational fixed licensees, operational fixed applicants operating pursuant to pre-authorization construction, and temporary fixed licensees. Applying these data points, the Channel Master software then finds all available non-interfering frequencies and identifies the SatPaq's transmit frequencies and satellite choice to ensure no harmful interference to any point-to-point receiver. The Channel Master software, as Higher Ground stated previously, performs an even more rigorous analysis than, and thus replaces, the protection zone approach identified in the Technical Appendix to the application.³

Higher Ground has successfully incorporated the Channel Master software into the SatPaq app, so that point-to-point microwave interference protection analysis can be conducted both by the SatPaq as well the SatPaq Network Controller at the Teleport.⁴ This makes SatPaq operations more efficient and enables mobility. Higher Ground will update the Channel Master

¹ FCC, *Connecting America: The National Broadband Plan*, at 98 (2010).

² See *Ex Parte* Letter to Marlene H. Dortch, FCC, from Adam D. Krinsky, Wilkinson Barker Knauer, LLP, IBFS File No. SES-LIC-20150616-00357 (Dec. 17, 2015).

³ *Id.*

⁴ See Higher Ground Application for a Blanket License to Operate C-band Mobile Earth Terminals, IBFS File No. SES-LIC-20150616-00357, Technical Appendix at 12 ("Technical Appendix") ("The look-up table, or a portion of it, may be off-loaded to the SatPaq, enabling the SatPaq to identify and select a suitable frequency to request transmission with SatPaq Network Control.").

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database of C-band point-to-point operations, including the database embedded in the SatPaq when ULS publishes new licensing or application information. Next, it will deliver these daily updates to the SatPaq app either via the smartphone's mobile data network or Wi-Fi, or via the satellite when the SatPaq is out of mobile network range. With regard to the latter option, the satellites will constantly broadcast the current Channel Master database version number and information about recent changes. A SatPaq will not transmit other than on the non-interfering hailing frequency if its database does not contain current information, absent frequency assignment from the SatPaq Network Controller. The SatPaq can use the hailing frequency to request relevant updates, and the satellite will deliver "new" C-band point-to-point receiver information to allow it to select a non-interfering frequency.

Notably, the SatPaq Network Controller at the Teleport will continue to maintain supervisory control of all operations. While the Channel Master software on the SatPaq app will select a non-interfering frequency, the SatPaq Network Controller can override the frequency selection and assign a different frequency or satellite for a SatPaq transmission. It will manage network usage to ensure compliance with adjacent satellite interference limits due to simultaneous transmissions by multiple SatPaqs. The Network Controller can always shut off the entire SatPaq operation by muting the forward path from a satellite necessary for the communication "handshake" and can also direct a specific SatPaq to suspend or delay its transmission.

In addition, the Technical Appendix to the application indicated that Higher Ground might "choose to increase the forward EIRP" from the satellite, but would stay below power flux density ("PFD") mask in Section 25.208(c) to protect point-to-point terrestrial fixed operations from satellite downlink interference.⁵ Higher Ground now seeks to increase the forward path EIRP from 27 dBW to approximately 30 dBW for each of the authorized satellites. It will separately submit revised tables (updating Tables A-5, A-6, and A-7 in the Technical Appendix) showing compliance with Section 25.208(c).

Response to CenturyLink's Ex Parte Filings

Higher Ground also responded to issues raised by CenturyLink in recent *ex parte* presentations.⁶ Mr. Reis visited CenturyLink in Denver, Colorado to explain SatPaq operations and provide a demonstration of the Channel Master software. CenturyLink characterized the meeting in a recent filing as "productive" and noted that that Higher Ground's "novel

⁵ *Id.* at 27.

⁶ See Letter from Tiffany West Smink, CenturyLink, to Marlene H. Dortch, Secretary, FCC, File No. SES-LIC-20150616-00357 (Mar. 4, 2016) ("CenturyLink March 4 *Ex Parte*"); Letter from Tiffany West Smink, CenturyLink, to Marlene H. Dortch, Secretary, FCC, File No. SES-LIC-20150616-00357 (Feb. 1, 2016).

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interference protection scheme is designed and has been continually refined to avoid interference.”⁷ Following the meeting with Mr. Reis, CenturyLink modified its requests to condition the Higher Ground authorization. Higher Ground responded to the proposed conditions during the FCC meeting.

First, there is no basis to require further testing, including testing of multiple SatPaq devices “within range of a fixed microwave license test facility.”⁸ Notably, CenturyLink does not raise any specific concerns with respect to any element of Higher Ground’s approach to interference protection or the Channel Master software. It simply notes an ongoing concern that “it is impossible to know whether the protection scheme will function as intended.”⁹ The fact is, Higher Ground has been engaged in rigorous testing of SatPaq technology since it obtained an experimental authorization in June 2014. It conducted testing for a year before filing the instant application for mobile earth terminal authorization in June 2015. And since then, Higher Ground has continued to test and improve SatPaq operations, with technical advancements as described above proven via test operations. In any case, the SatPaq demonstration at the FCC shows exactly what CenturyLink seeks: “that the SatPaqs and system will function in the real world as modeled and will not cause harmful interference to fixed receivers operating in the C-band.”¹⁰

Second, multiple SatPaqs operating in the same location at the same time do not pose a risk of harmful interference to point-to-point receivers, and CenturyLink provides no technical or analytical basis in support of its concern. As noted, the Channel Master link analysis requires that, to be authorized on a particular frequency, a SatPaq must stay 6 dB (or more) below Boltzman Noise generally. If two SatPaqs were in the exact same location, transmitting in the exact same 1.5 second timeframe, on the exact same frequency and pointed in the exact same direction, the combined signals would still be 3 dB below Boltzman Noise. CenturyLink does not dispute this. And the likelihood of such a circumstance is extremely low. Similar to the statistical showing in the Technical Appendix,¹¹ Higher Ground engaged in a statistical analysis to assess the likelihood that two SatPaqs would transmit from the same location, within the same 1.5 second time period, to the same frequency, connecting to the same satellite. The conservative analysis assumed a population density at Yosemite National Park on its busiest day ever recorded (2,600 people per square mile), and found it would be two years (or more) for a second “interfering” burst of two unrelated co-located SatPaqs (with a combined noise level of 3 dB below Boltzman). CenturyLink acknowledges that “certain statistical assumption and propagation modeling assumptions suggest that the likelihood of combinatorial interference is

⁷ CenturyLink March 4 *Ex Parte* at 1.

⁸ *Id.* at 2.

⁹ *Id.*

¹⁰ *Id.* at 1.

¹¹ See Technical Appendix at 22-24.

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small,”¹² and it does not provide technical bases in support of its multiple SatPaq concern. The risk of multiple co-located SatPaqs cannot be considered harmful interference.

Third, CenturyLink’s request that Higher Ground provide C-band licensees with a three-month notification prior to further testing or initial launch, along with detailed descriptions of planned activities, is unnecessary and unduly burdensome. Higher Ground’s existing experimental authorization adequately addresses any concern regarding notice: It requires Higher Ground to notify nearby point-to-point operations in advance of SatPaq operations, along with a 24/7 point-of-contact.¹³ Higher Ground has complied with this condition, and point-to-point operators have not registered a single complaint or even a question as to whether SatPaq operations may be causing interference. CenturyLink’s call for lengthy and granular notification is therefore unwarranted.

Fourth, Higher Ground already plans to meet the vast majority of CenturyLink’s proposed operating requirements (including maintaining a log of SatPaq locations and transmissions, providing a direct contact in case of harmful interference and a contact who can work jointly to quickly resolve harmful interference, and immediately ceasing SatPaq transmissions in the event of a database outage). Specifically, Higher Ground will maintain an automated log of SatPaq locations and transmissions. In addition, as part of the application, Higher Ground has provided a direct contact for addressing interference issues, as well as contact information for the gateway earth stations that interface with SatPaq Network Control.¹⁴ And SatPaq Network Control has the ability to shut off any SatPaq immediately upon notification of harmful interference.¹⁵ The request for written notification of any change of model or method used to calculate interference is unwarranted, however, and should be rejected. CenturyLink offers no Commission rule or policy that would support such a requirement.

Fifth, there is no basis to restrict a Higher Ground authorization to a geographically limited, non-nationwide area of license. The request is unsupported and contrary to the Commission’s prior grants of blanket licenses for other mobile earth terminals on a nationwide basis. Importantly, the proposal would deprive consumers of the benefits of a new nationwide satellite service offering.

¹² CenturyLink March 4 *Ex Parte* at 1.

¹³ See Higher Ground LLC, Experimental License Modification, ELS File No. 0124-EX-ML-2015 (granted Aug. 17, 2015); Higher Ground LLC, Experimental License Modification, ELS File No. 0036-EX-ML-2016 (granted Mar. 18, 2016).

¹⁴ See Letter from Adam D. Krinsky, Counsel to Higher Ground, to Paul E. Blais, FCC, File No. SES-LIC-20150616-00357, at 3 (July 30, 2015) (citing Higher Ground response in FCC Form 312, Schedule B, Question E2).

¹⁵ See *id.* (citing Higher Ground response in FCC Form 312, Schedule B, Question E65).

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Finally, CenturyLink's call for Higher Ground to indemnify it for "all costs associated with any service degradation or outage" and for "any and all fines, penalties, or legal complications resulting from service disruption or outage" must be rejected.¹⁶ This demand is unprecedented, as there is no privity between CenturyLink and Higher Ground and no basis for indemnification. Indeed, while the Commission has acknowledged that indemnification agreements between private parties may be reasonable, it has never sought to impose indemnification obligations where no such agreement exists.¹⁷ CenturyLink cites no precedent in support and makes no reference to any Communications Act provision or FCC policy empowering the Commission to require such broad indemnification. Higher Ground will be a Commission licensee subject to Commission oversight, and this is sufficient cause for company operations to avoid harmful interference.

If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

/s/ Adam D. Krinsky

Adam D. Krinsky

Attachment

cc:	Mindel De La Torre	Jay Whaley
	Jose Albuquerque	Blaise Scinto
	Kerry Murray	Stephen Buenzow
	Paul Blais	Tiffany West Smink, CenturyLink
	Stephen Duall	Susan H. Crandall, Intelsat
	Cindy Spiers	David E. Meyer, Nat'l Spectrum Management Ass'n
	Hsing Liu	Laura Stefani, Fixed Wireless Communications Coalition

¹⁶ CenturyLink March 4 *Ex Parte* at 3.

¹⁷ See e.g., *XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc.*, 25 FCC Rcd 14779, 14796 (2010) ("conclude[ing] that Sirius XM should be permitted to require lessees to indemnify Sirius XM against liability arising from their conduct as lessees [and] ... declin[ing] to adopt specific conditions or limits regarding the type of contractual indemnification agreement or the amount of coverage or the type of insurance policy that Sirius XM may require."); *Comcast Corp., General Electric Co., and NBC Universal, Inc.*, 26 FCC Rcd 4238, 4360 (2011) ("if a reasonable dispute exists or arises regarding whether a C-NBCU Programmer has the right to grant an OVD the right to the Video Programming at issue, the C-NBCU Programmer may require the Qualified OVD to indemnify it and hold it harmless against any breach of contract, tort, copyright violation or other claim arising out of any lack of right of the C-NBCU Programmer to grant the OVD the right to Video Programming.").

ATTACHMENT

Mindel De La Torre, International Bureau (attended the demonstration)

Jose Albuquerque, International Bureau

Kerry Murray, International Bureau

Paul Blais, International Bureau

Stephen Duall, International Bureau (attended meeting via telephone)

Cindy Spiers, International Bureau

Hsing Liu, International Bureau

Jay Whaley, International Bureau

Blaise Scinto, Wireless Telecommunications Bureau

Stephen Buenzow, Wireless Telecommunications Bureau